CLAIMS

1. A method for production of three-dimensional bodies by successive fusing together of selected areas of a powder bed, which parts correspond to successive cross sections of the three-dimensional body, which method comprises the following method steps:
application of powder layers to a work table,
supplying energy from a radiation gun according to an operating scheme determined for the powder layer to said selected area within the powder layer, fusing together that area of the powder layer selected according to said operating scheme for forming a cross section of said three-dimensional body, a three-dimensional body being formed by successive fusing together of successively formed cross sections from successively applied powder layers, characterized in that an energy balance is calculated for said selected area, it being determined in the calculation whether energy radiated into the selected area from the surroundings of the selected area is sufficient to maintain a defined working temperature of the selected area.

2. The method as claimed in claim 1, characterized in that, in addition to said energy for fusing together the selected area, energy for heating the selected area is supplied if the result of the energy balance calculation is that sufficient energy for maintaining an intended working temperature of the selected area is not present, a defined working temperature of the selected area then being achieved.

3. The method as claimed in claim 1 or 2, characterized in that the energy balance for each powder layer is calculated according to $E^{in}(i) = E^{out}(i) + E^{heat}(i)$, where $E^{in}(i)$ represents energy fed into the selected area, $E^{out}(i)$ represents energy losses through dissipation and radiation from the part area, and $E^{heat}(i)$ represents stored in the selected area.

4. The method as claimed in any one of the preceding claims, characterized in that the selected area is divided into a set of separate areas, an energy balance being calculated for each of said set of separate areas.

5. The method as claimed in claim 4, where each separate area comprises an inner area and an edge, characterized in that the inner area of a set of adjacent separate areas is fused together in a first process step, after which said edges between said separate areas are fused together.

6. An arrangement for producing a three-dimensional product, which arrangement comprises a work table on which said three-dimensional product is to be built up, a powder dispenser which is arranged so as to distribute a thin layer of powder on the work table for forming a powder bed, a radiation gun for delivering energy to the powder, fusing together of the powder then taking place, means for guiding the beam emitted by the radiation gun over said powder bed for forming a cross section of said three-dimensional product by fusing together parts of said powder bed, and a control computer in which information about successive cross sections of the three-dimensional product is stored, which cross sections build up the three-dimensional product, where the control computer is intended to control said means for guiding the radiation gun over the powder bed according to an operating scheme forming a cross section of said three-dimensional body, said three-dimensional product being formed by successive fusing together of successively formed cross sections from by the powder dispenser, characterized in that the control computer is also arranged so as to calculate an energy balance for at least one part area within each powder layer, it being determined in the calculation whether energy radiated into the part area from the surroundings of the part area is sufficient to maintain a defined working temperature of the part area.

7. The arrangement as claimed in claim 6, characterized in that the control computer is arranged so as to control said operating scheme for

supply of, in addition to said energy for fusing together powder layers, energy for heating the powder layer if the result of the energy balance calculation is that the operating scheme is not providing sufficient energy for maintaining an intended working temperature of the part area, a defined working temperature of the part area then being maintained.

8. The arrangement as claimed in claim 6 or 7, characterized in that the control computer is arranged so as to calculate the energy balance for each powder layer according to E^{in} (i) = E^{out} (i) + E^{heat}(i), where E^{in} (i) represents energy fed into the part area, E^{out} (i) represents energy losses through dissipation and radiation from the part area, and E^{heat}(i) represents energy stored in the part area.

9. The arrangement as claimed in any one of claims 6-8, characterized in that the control computer is arranged so as to divide the surface within each powder layer into a set of separate areas, an energy balance being calculated for each of said set of separate areas.

10. The arrangement as claimed in claim 9, where each separate area comprises an inner area and an edge, characterized in that the control computer is arranged so as to guide an energy-delivering beam from said radiation gun according to said operating scheme so as to allow the inner area of a set of adjacent separate areas to be fused together in a first process step, after which said edges between said areas are fused together.

11. The arrangement as claimed in one of claims 9-10, characterized in that the control computer is arranged so as to guide an energy-delivering beam from said radiation gun according to said operating scheme so as to allow said inner areas to be fused together in the course of a partly overlapping circular movement of the beam of the radiation gun.

12. The arrangement as claimed in any one of claims 6-11, characterized in that the arrangement also comprises means for sensing the temperature distribution of a surface layer located in the powder bed.